AN ISO SCHEME FOR USE AS A REVIEW GUIDE OR FOR CERTIFICATION OF PERFORMANCE-BASED FIRE SAFETY DESIGNS

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A proposal for development

August 2017

August 2017

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Summary

This paper proposes development of an ISO scheme that could be used either as a review guide or for the certification of a performance-based[1] fire safety design in accordance with ISO 23932 – Fire Safety Engineering: General Principles[2]. Deytec, Inc., a company member of the American National Standards Institute (ANSI), plans to propose the development of this ISO scheme to the ANSI International Conformity Assessment Committee (ICAC) which is the U.S. interface to the ISO Council Committee on Conformity Assessment (ISO CASCO). ISO CASCO writes standards and guides for the effective operation of conformity assessment bodies and activities. The purpose of the proposed scheme is to address present issues faced by national authorities and applicants in the review and approval of performance-based fire safety designs.

Background

Conformity assessment (CA) is the term given to techniques and activities that ensure a product, process, service, management system, person or organization fulfils specified requirements. ISO CASCO has published a wide variety of conformity assessment standards that can be used and be beneficial for the conformity assessment of fire safety designs based on fire safety engineering (FSE).

These include standards for product certification. Currently, conformity assessment standards developed by ISO CASCO are already used for the fire certification of building product assemblies. These are ISO/IEC 17025 for testing laboratories, 17020 for inspection agencies, and 17065 for certification agencies. Certified fire products such as fire-resistance-rated walls and floor-ceilings; through penetrations; fire doors, frames and hardware; and fire dampers are required to be certified with marks of conformity in national building codes (see Intertek SFPE webinar).

Need for a Conformity Assessment Scheme

There are presently no suitable conformity assessment methods or standards available for the review or certifications of performance-based fire safety designs, even though these alternate designs are used to justify relief from prescriptive code requirements that specify use of certified fire protection products. It will be beneficial for the requirements of performance-based designs, and conformity assessment to these requirements, to evolve to the same high standards set for prescriptive fire protection requirements in national building fire codes.

Product certification is an established conformity assessment activity that provides confidence to consumers, regulators, industry and other interested parties that products conform to specified requirements. National authorities may wish to implement a product certification system for performance-based designs (a product) utilizing the same conformity assessment standards discussed above used to meet building prescriptive fire codes. However, a scheme is needed for use in such certifications.

A scheme contains the rules, procedures and management for implementing product, process and service certification. ISO/IEC 17067 provides the fundamentals of product certification and guidelines for product certification schemes but tends to focus on tangible products. A separate similar document has been proposed in CASCO that would address schemes for a process such as in ISO 23932. This separate CASCO activity should assist in the development of the scheme proposed here. A scheme may also be used by the national authority as a guide, at least initially, to gain experience and before moving

[1] Performance-based is used synonymously here with fire safety engineering (see ISO 13943).
[2] A revised ISO 23932 is planned to be published in 2018.

toward a formal requirement for certification. Such a scheme that could be used as a review guide or for certification will provide benefits to all stakeholders in the industry worldwide.

These benefits will be in the form of higher quality assurance for public safety, decreased uncertainty for applicants as to whether a performance-based design will be approved, and consistency and uniformity in the approval process. A major benefit can be achieved by the proposed scheme by decreasing the significant costs associated with obtaining approval of a performance-based design. Presently, third party reviews are used consisting of experts from academia and other consulting companies that are required to judge every detail of the analysis without any guide or scheme. A major goal of the proposed scheme is to decrease these costs for applicants. The scheme will allow the use of other technical standards available in the country to streamline the review process. Such a system should encourage the further development of technical standards, where needed.

Content of Scheme

As mentioned above, the proposed scheme will address the technical requirements of ISO 23932. It will contain the rules, procedures and management for implementing certification per ISO/IEC 17065 discussed above, or for use as a guide.

The scheme will address laws, regulations, and standards in the specific country of use that contain requirements for the performance-based fire safety design. Applicants may use these when requesting approval or certification. An option may also be included in the scheme for a certification process for the entire fire safety program, including the protection features that comply with the prescriptive requirements. This option could be used in the future as the two sets of requirements of requirements are integrated and put in context (see Unified Framework).

An audit of the process requirements in ISO 23932 will be used to determine adequacy of an application when detailed technical requirements are lacking in laws, regulations and standards in the country of use. The ISO set of fire safety engineering standards that supplement ISO 23932 are available for use in the country for some further detailed technical requirements. The method of using process reviews when detailed technical requirements or performance criteria are lacking should alleviate the costly reviews of the details of performance-based applications. Key issues that arise in the review of performance-based fire safety designs are design fire scenarios and design fires, verification and validation of fire calculation methods for the application, use of simple algebraic equations versus more complex zone or CFD models, and input data used for the fire calculations. The reviews of these details in an application can be complex, time consuming and costly. A goal of the scheme would be avoid such detailed reviews, but yet maintain confidence and quality assurance in the approval process.

The purpose and approach to the proposed scheme will necessarily evolve with deliberations in the working group as this endeavor will be new and innovative in the industry.

Conclusion

The proposed scheme should provide significant benefits by providing higher quality assurance for public safety, and reduced costs for the applicants. Consistency and uniformity in the approval process will be achieved.

References

1. ISO 23932 – Fire Safety Engineering, General Principles

2. ISO/IEC 17020:2012 - Conformity assessment -- Requirements for the operation of various types of bodies performing inspection.
3. ISO/IEC 17025:2005 - General requirements for the competence of testing and calibration laboratories.
4. ISO/IEC 17065:2012 - Conformity assessment -- Requirements for bodies certifying products, processes and services.
5. “Fire Performance Testing,” SFPE Webinar, December 16, 2015, Michael Beaton, Intertek.
6. ISO/IEC 17067:2013 - Conformity assessment -- Fundamentals of product certification and guidelines for product certification schemes.
7. ISO/IEC TR 17026:2015 - Conformity assessment -- Example of a certification scheme for tangible products.
8. ISO 14065:2013 - Greenhouse gases — Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.
9. ISO/IEC TS 17021-7 - Conformity assessment — Requirements for bodies providing audit and certification of management systems — Part 7: Competence requirements for auditing and certification of road traffic safety management systems.

